[210] Attorney Docket No. : ADP-131US PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	:	Lisa C. Chacon, Adam J. G. Ellison, George B. Hares, Jeffrey T. Kohli, Josef C. Lapp, and Robert Morena
Serial No.	:	09/443,260
Filed	:	November 22, 1999
For	:	GLASSES FOR FLAT PANEL DISPLAYS
Examiner	:	K. Group
Group	:	1755

Commissioner of Patents and Trademarks
Washington, D.C. 20231

DECLARATION OF JOSEF C. LAPP UNDER 37 C.F.R. §1.132

I, Josef C. Lapp, declare as follows:

1. I am a Development Associate at Corning Incorporated (Corning), the assignee of the above-identified application. My education and experience in the field of glass technology is as follows. In 1982, I received a Masters degree in glass science from the New York State College of Ceramics at Alfred University, Alfred, New York, and in 1986 I received a Ph.D. in ceramics, again from Alfred University. I joined Corning in 1986 and since that time I have worked on the formulation and manufacture of various glass products, including glasses for liquid crystal displays (LCDs) on which I have worked substantially exclusively since 1993.

2. I have studied the Office Action issued by the United States Patent and Trademark Office on November 27, 2000, regarding the above application, as well as the prior art references cited in that Office Action. I make this Declaration in support of an Amendment being submitted herewith in response to that Office Action.

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3. In particular, I make this Declaration to report the results of a test that was performed at Corning under my direction and supervision to determine the liquidus viscosity of Example 14 of Kohli, U.S. Patent No. 6,060,168 (the Kohli patent), which like the present application is assigned to Corning. As discussed below, the liquidus viscosity for this example was determined to be 171,935 poises.

4. The materials used in the test were:

Raw Material	Weight (gms)
Sand, Berkeley Silcosil 75	2592.37
Alumina, 325 mesh	676.43
Boric Oxide; H.P.	267.69
Boric Acid	429.30
Magnesia; P-98-30	24.24
Limestone; Mississippi	514.20
Strontium Carbonate; CPC	94.38
Antimony Trioxide	55.83

Each of these materials is of the type commonly used in the glass industry to prepare boro-aluminosilicate glasses. I reviewed Corning's records relating to the original preparation of Example 14 and determined that the same materials were used when the glass of this example was originally prepared, except that alumina from a different source, no longer available, was employed in the original preparation. The alumina used in the original preparation and the alumina used in the test are equivalent raw materials in terms of tramp contaminants and melting behavior.

5. As indicated in the above table, a fining agent, specifically, Sb_2O_3, was used to remove gaseous inclusions from the melt. The Kohli patent also discusses the use of fining agents and my review of Corning's records for the original preparation of Example 14 showed that Sb_2O_3, at the level used for the present test, was used in the original preparation. The

weight percents of the batch ingredients used in the test were as follows, where re-normalized values with the fining agent removed are also listed:

Wt%	Test		US 6,060,168
	As prepared	w/o Sb_2O_3	Example 14
SiO_2	61.5	62.4	62.4
Al_2O_3	16.1	16.3	16.3
B_2O_3	12.1	12.2	12.2
MgO	0.6	0.6	0.6
CaO	6.7	6.9	6.9
SrO	1.6	1.6	1.6
Sb_2O_3	1.3	-	-

6. The batch ingredients of paragraph 4 were mixed for 15 minutes using a Turbula mixer. The mixed ingredients were then charged into an 1800 cc platinum crucible, covered with a refractory cover, and placed in an electrically heated furnace at 1640°C for 16 hours. To ensure homogeneity, the melt was stirred for 15 minutes using a platinum stirrer. The melt was then removed from the furnace and poured into water in a process known as drigaging. This creates a fine glass powder and again aids with creating homogenous glass. After drying, the drigage powder was again charged into an 1800 cc platinum crucible and remelted at 1640°C for 4 hours. The melt was cast into a patty shape by pouring the melt onto a cold steel table. The glass patty was then annealed at 735°C. This procedure closely follows that originally used in the preparation of Example 14.

7. The high temperature viscosity of the glass was determined using rotating cylinder viscometry (ASTM C965-81). This technique, which is also known as rotating spindle viscometry, is based on the measurement of the rotation of a spindle immersed in a test glass as a function of temperature. In the temperature range of approximately 1000°C to 1500°C,

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the technique has a precision of approximately 2°C. The raw data obtained using the technique, in the form of viscosity (poises) and temperature (°C), was fit with a Fulcher equation of the form:

$$Log_{10} \eta = A + B/(T-T_o)$$

where η is viscosity (poises), T is temperature (°C) and A, B, and T_o are constants.

8. For the test glass, the following Fulcher constants were determined:

A = -2.985

B= 6781.8

T_o= 310.0

9. Using these constants and the liquidus temperature of 1135°C reported in the Kohli patent for Example 14, a calculated liquidus viscosity of 171,935 poises was obtained for the test glass.

10. I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

May 24, 2001
(Date)

Josef C. Lapp

[227] Attorney Docket No. : ADT-131.1US PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	:	Lisa C. Chacon, Adam J. G. Ellison, George B. Hares, Jeffrey T. Kohli, Josef C. Lapp, and Robert Morena
Serial No.	:	09/990,750
Filed	:	November 16, 2001
For	:	GLASSES FOR FLAT PANEL DISPLAYS
Examiner	:	K. Group
Group	:	1755

Commissioner of Patents and Trademarks
Washington, D.C. 20231

SUBMISSION OF TERMINAL DISCLAIMER

Submitted herewith is a terminal disclaimer for the above-identified patent application.

Fee Payment

(X)	other than a small entity	$110.00
( )	small entity	$ 55.00
	( ) verified statement is attached	
	( ) verified statement previously submitted	

A check in the amount of $110.00 is enclosed.

The Commissioner is hereby authorized to charge any additional fees which may be required by this paper, or credit any overpayment, to Deposit Account No. 11-1158.

Respectfully submitted,

Date: 7/3/02

Maurice Klee

Maurice M. Klee, Ph.D.
Reg. No. 30,399
Attorney for Applicant
1951 Burr Street
Fairfield, CT 06824
(203) 255-1400

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SUPPLEMENTAL DECLARATION OF
JOSEF C. LAPP UNDER 37 C.F.R. §1.132

I, Josef C. Lapp, declare as follows:

1. I am the Josef C. Lapp who submitted a "Declaration of Josef C. Lapp Under 37 C.F.R. §1.132" in U.S. Application No. 09/443,260 from which the above-identified application claims priority. A copy of my prior declaration is attached as Exhibit E hereto.

2. I make this supplemental declaration in connection with an Amendment which I understand is being filed herewith in response to a March 5, 2002 Office Action regarding the present application.

3. Paragraphs 3-9 of my original declaration describe tests that were performed at Corning Incorporated under my direction and supervision to determine the liquidus viscosity of Example 14 of Kohli, U.S. Patent No. 6,060,168 (the Kohli patent). Using the same techniques described in my original declaration, Examples 8, 9, 10, and 15 of the Kohli patent were prepared and tested, again under my direction and supervision.

4. Exhibit A hereto is a table showing the raw materials used in these tests, while Exhibit B sets forth the weight percents of the batch ingredients used in the tests, both before and after re-normalization with the refining agent removed. The tables of these exhibits correspond to the

tables which appear in paragraphs 4 and 5 of my original declaration. Example 10 of the Kohli patent includes BaO as a component and for this component, barium carbonate, a standard material used in the glass making industry, was used as the source material.

5. Following the procedures described in paragraphs 7 and 8 of my original declaration, high temperature viscosities were determined for these glasses using rotating cylinder viscometry and the resulting data was fit with a Fulcher equation of the form $\log_{10} \eta = A + B/(T-T_0)$. Exhibit C sets forth the A, B, and T_0 values determined in this way for Examples 8, 9, 10, and 15 of the Kohli patent. Using these constants and the liquidus temperatures reported in the Kohli patent, the following liquidus viscosity values were calculated for these examples:

Example 8 -- < 23,000 poise

Example 9 -- 30,000 poise

Example 10 -- < 27,000 poise

Example 15 -- 134,000 poise.

6. I have read Nishizawa et al. U.S. Patent No. 5,801,109 and EP 714,862 (Nishizawa) and am familiar with the data which the reference sets forth for its 32 examples. For each of its examples, the reference provides four temperature values, namely, a liquidus temperature, a 10^2 poise temperature, a 10^4 poise temperature, and a strain point temperature. For eight of the examples, specifically, Examples 5, 6, 9, 13, 15, 16, 17, and 21, liquidus viscosities can be determined directly from the reported liquidus temperatures since the liquidus temperature and the 10^4 poise temperature are the same. Accordingly, the liquidus viscosity for each of Examples 5, 6, 9, 13, 15, 16, 17, and 21 is 10,000 poises.

7. The remaining examples of Nishizawa have liquidus temperatures that are from 10°C to 60°C lower than their 10^4 poise temperatures, and thus the liquidus viscosities for these examples are

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somewhat higher than 10,000 poise. To calculate liquidus viscosities for these examples, I used the 10^2 poise, 10^4 poise, and strain point temperatures reported in Nishizawa to determine Fulcher constants (i.e., A, B, and T_0 values) for each of Examples 1-4, 7-8, 10-12, 14, 18-20, and 22-32. For the strain point temperature, I used the customary viscosity value of $10^{14.6}$ poise. As a check of the procedure, I performed the same single Fulcher curve fit over the same large range of viscosities for Corning's commercial 1737F LCD glass for which measured viscosity data at a variety of temperatures is available. I found that at 1310°C where 1737F glass has a viscosity of about 10,000 poises, the offset between calculated and measured viscosities was less than 1%.

8. Exhibit D sets forth the Fulcher constants which I obtained in this way for Nishizawa's Examples 1-4, 7-8, 10-12, 14, 18-20, and 22-32. Using these constants and the liquidus temperatures reported in Nishizawa for these examples, I calculated liquidus viscosities using the Fulcher equation. All of those liquidus viscosities were less than 30,000 poise. In particular, the liquidus viscosities ranged from 11,710 poises for Example 18 to 27,695 poises for Example 23.

9. I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

June 27, 2002
(Date)

Josef C. Lapp

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